# 國立彰化師範大學
# 機電工程學系博士班畢業條件表暨課程架構表
# (109學年度入學學生適用)

National Changhua University of Education

Graduation Requirements and Course Structure for PhD Program of Mechatronics Engineering

(Applicable for students in 109 academic year)

列印日期(Print Date:2025/11/10)

## 一.系必修課程

## I.Department Required Courses

| 課程名稱<br>Course Name | 學分/學時<br>Credit(s)/<br>Hour(s) | 年級<br>Grade | 學期<br>Semester |
|---|---|---|---|
| 書報討論(一)<br>Seminar I | 1/2 | 1 | 1 |
| 書報討論(二)<br>Seminar II | 1/2 | 1 | 2 |
| 論文指導(一)<br>Thesis Supervision I | 3/3 | 2 | 1 |
| 論文<br>Thesis | 0/0 | 2 | 2 |
| 論文指導(二)<br>Thesis Supervision II | 3/3 | 2 | 2 |

## 二.系選修課程

## II.Department Elective Courses

| 課程名稱<br>Course Name | 學分/學時<br>Credit(s)/<br>Hour(s) |
|---|---|
| 人工智慧<br>Artificial Intelligence | 3/3 |
| 工程設計最佳化<br>Engineering Design Optimization | 3/3 |
| 工程設計與分析<br>Engineering Design and Analysis | 3/3 |
| 互聯網系統設計<br>Internet System Design | 3/3 |
| 太陽電池原理與製程<br>Principle and Process of Solar Cells | 3/3 |
| 可靠度工程(一)<br>Reliability Engineering I | 3/3 |
| 平面顯示器導論(一)<br>Introduction to Flat Panel Display (I) | 3/3 |
| 生醫微機電系統<br>Biomedical microelectromechanical systems | 3/3 |
| 光機系統設計<br>Opto-mechanical Systems Design | 3/3 |
| 系統設計與動態分析<br>System Design and Dynamic Analysis | 3/3 |

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| 奈米結構製程(一)<br>Nanostructure Fabrication I | 3/3 |
| 科技英文(一)<br>English for Science and Technology I | 3/3 |
| 高等工程數學<br>Advanced Engineering Mathematics | 3/3 |
| 微感測技術與應用<br>Design and Applications of Microsensors | 3/3 |
| 電子封裝<br>Electronic Encapsulation | 3/3 |
| 影像辨識與人工智慧<br>Image Recognition and Artificial Intelligence | 3/3 |
| 數位影像處理<br>Digital Image Processing | 3/3 |
| 數值分析<br>Numerical Analysis | 3/3 |
| 機械振動學<br>Mechanical Vibration | 3/3 |
| 應用電子學<br>Applied Electronics | 3/3 |
| 人工智慧物聯網系統設計<br>AIoT | 3/3 |
| 元件破壞分析方法與原理<br>Methodology and Theory of Component Failure Analysis | 3/3 |
| 功能性薄膜材料<br>Funtional Thin Film Materials | 3/3 |
| 可靠度工程(二)<br>Reliability Engineering II | 3/3 |
| 平面顯示器技術<br>Flat Panel Display Technology | 3/3 |
| 平面顯示器導論(二)<br>Introduction to Flat Panel Display (II) | 3/3 |
| 光電半導體元件<br>Optoelectronic Semiconductor Devices | 3/3 |
| 光學系統設計<br>Optical system design | 3/3 |
| 有限元素分析<br>Finite Element Analysis | 3/3 |
| 奈米機電系統<br>Nano-Electro-Mechanical Systems | 3/3 |
| 物理光學<br>Physical Optics | 3/3 |
| 科技英文(二)<br>English for Science and Technology II | 3/3 |
| 現代控制工程<br>Modern Control Engineering | 3/3 |
| 精密工具機技術專題<br>Research Topoic on Precision Machine Tools | 3/3 |
| 精密運動控制<br>Precise Motion Control | 3/3 |

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| 精密機械<br>Precision Machinery | 3/3 |
| 數位控制<br>Digital Control | 3/3 |
| 顯示元件物理<br>Display Device Physics | 3/3 |
| 工具機系統設計分析<br>Machine Tool System Design and Analysis | 3/3 |
| 加速測試與失效分析<br>Principles of Reliability Engineering | 3/3 |
| 有機發光二極體簡介<br>Introduction to OLED | 3/3 |
| 系統動態與控制<br>System Dynamics and Control | 3/3 |
| 非線性振動學<br>Nonlinear Vibration | 3/3 |
| 散熱模組設計與應用<br>Thermal Module Design and Application | 3/3 |
| 智慧型控制系統設計<br>Intelligent Control System Design | 3/3 |
| 智慧型監控系統設計<br>Smart Monitor System Design | 3/3 |
| 結構力學<br>Structural Mechanics | 3/3 |
| 結構動態與控制<br>Structure Dynamics & Control | 3/3 |
| 微波電路設計與量測<br>Microwave Circuit Design and Measurement | 3/3 |
| 微波積體電路設計<br>Microwave Integrated Circuit Design | 3/3 |
| 解析動態學<br>Analytical Dynamics | 3/3 |
| 雷射加工系統設計<br>Design of the Laser Processing Systems | 3/3 |
| 電子商務自動化專題<br>E-commerce Automation | 3/3 |
| 實驗設計與工程分析<br>Experimental Design and Engineering Analysis | 3/3 |
| 薄膜製程與應用<br>The flim processes and appilications | 3/3 |
| 類比積體電路設計<br>Analog Integrated Circuit Design | 3/3 |
| 觸控面板<br>Touch Panel | 3/3 |
| CMOS 微機電系統設計與應用<br>Design and Application of CMOS MEMS | 3/3 |
| 生醫光電<br>Biophotonics | 3/3 |
| 奈米專題<br>Special Topic :Nano Material | 3/3 |

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| 奈微系統製程<br>Nano- and Microfabrication | 3/3 |
| 奈微機電系統<br>Nano & Microelectromechanic System | 3/3 |
| 科技英文寫作<br>Technical English Writing | 3/3 |
| 軟性電子<br>Flexible Electronics | 3/3 |
| 單晶片控制與應用<br>Single Chip CPU Control & Application | 3/3 |
| 超高速積體電路硬體描述語言<br>VHDL | 3/3 |
| 雲端科技<br>Icloud Technology | 3/3 |
| 微位移與感測技術<br>Micro Positioning and Measurement | 3/3 |
| 微機電系統雷射加工<br>Laser Processing Micro-Components and MEMS | 3/3 |
| 微機電顯示技術<br>MEMS Display Technology | 3/3 |
| 微機器學習與感測應用<br>Applications of Tiny Machine Learning and Sensing | 3/3 |
| 電子陶瓷概論<br>Introduction to Electronic Ceramics | 3/3 |
| 電腦、通訊與控制<br>Computer, Communication, and Control | 3/3 |
| 彈性力學<br>Theory of Elasticity | 3/3 |
| 機電系統整合設計<br>Mechatronics System Integration Design | 3/3 |
| 薄膜材料與分析專題<br>Special Topics on Thin Film Materials and Analysis | 3/3 |
| 顯示材料與製程<br>Materials and Processes in Display Devices | 3/3 |

**三.先修科目**

**III.Prerequisite Courses**

| 先修課程<br>Prerequisite Course | 後修課程<br>Subsequent Course |
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**四.畢業條件**

**IV.Graduation Requirements**

1.最低畢業學分數：24學分（不含教育學程、論文、論文指導、書報討論）。
2.凡選修本系研究所開設科目（不限學期），一律承認為本系畢業學分。
3.因論文研究需要須經指導教授同意後，准予修習外系或外校研究所開設科目，至多承認9學分（選課前送教授同意表至系辦備查）。
4.修習本、外系開設之非博士班課程，不得承認為博士班畢業學分。
5.學生除須修滿應修學分外，同時須符合「機電工程學系博士學位資格考試施行細則」及「機電工程學系博士學位考試細則」，方具備畢業資格。
6.【研究生應於申請學位考試前修習通過於「臺灣學術倫理教育資源中心」(https://ethics.nctu.edu.tw/)網路教學平台之「學術研究倫理教育」課程】等相關規定。

1. Minimum graduation credits: 24 credits (excluding education program, thesis, thesis supervision, and seminars).
2. Any courses taken from this department's graduate program (regardless of the semester) will be recognized as part of the department's graduation credits.
3. Subject to approval of the advisor for thesis research needs, students may take courses offered by other departments or universities, with a maximum of 9 credits recognized (a consent form must be submitted to the department office for record before course registration).
4. Courses offered by this or other departments that are not part of the doctoral program cannot be counted towards doctoral program graduation credits.
5. In addition to completing the required credits, students must also meet the requirements of the "Mechatronic Engineering Department's Doctoral Qualifying Exam Procedures" and "Mechatronic Engineering Department's Doctoral Examination Regulations" to qualify for graduation.
6. Graduate students must complete and pass the "Academic Research Ethics Education" course offered by the Taiwan Academic Ethics Education Resource Center (https://ethics.nctu.edu.tw/) on its online teaching platform, among other related requirements, before applying for the degree examination.